

APPENDIX B AIR QUALITY TECHNICAL CALCULATIONS

MOBILE SOURCE EMISSIONS CALCULATIONS

Assumptions	
Worse Case Evaluation Year	2002
Fleet Mix:	
Light Duty Autos (LDA)	80%
Light Duty Trucks (LDT)	20%
Assumed Variable Start Parameters (note 5):	
Percent of Inbound Vehicles with 20min Cold Start	50%
Percent of Inbound Vehicles with 4hr Cold Start	25%
Percent of Inbound Vehicles with 12hr Cold Start	25%
Percent of Outbound Vehicles with 20min Cold Start	0%
Percent of Outbound Vehicles with 4hr Cold Start	100%
Percent of Outbound Vehicles with 12hr Cold Start	0%
Average Speed (note 3)	30 mph
Peak PM Hour Trips on Weekday (note 4)	1360
Peak PM Hour Trips on Saturday Special Event (note 5)	2070
Percent of Peak Daily Trips Equivalent to Peak PM Hour Trips	30%
Number of Peak "Operating" Saturday Special Events Per Year	52
Number of Peak "Operating" Weekdays Per Year	313
All vehicles with catalysts	
All vehicles gasoline powered	
Emission Factors Based on Winter Conditions with 50 F Average Temperatures (Worse Case)	

Ignore hot soak, diurnal, and hot soak.

Trip Generation Values Based on Fehr & Peers Associates Memoranda
dated October 26, 2000 and May 22, 2001.

Emission Factors (note 1)

Weighted Average Running Emission Rate	Units	Light Duty Autos	Light Duty Trucks	Weighted Average
VOC	g/mi	0.27	0.29	0.27
CO	g/mi	3.46	3.67	3.50
NOx	g/mi	0.44	0.67	0.48
PM10	g/mi	0.20	0.20	0.20

Variable Starts Emission Rate	Units	20 Pre-Soak Start			4 hr Pre-Soak Start			12 hr Pre-Soak Start		
		LDA	LDT	Weighted Average	LDA	LDT	Weighted Average	LDA	LDT	Weighted Average
VOC	g/trip	1.06	1.24	1.10	3.46	4.66	3.70	4.72	5.55	4.88
CO	g/trip	11.71	13.66	12.10	42.94	50.60	44.47	54.22	63.96	56.17
NOx	g/trip	1.06	1.63	1.17	2.03	2.71	2.16	1.54	2.33	1.69

Weekday Emission Rates

Impact from New Trips (Pass-By Trips Removed)	Number of New Trips Per Day	Average Distance Traveled Per Trip (mi), (note 2)	Total Miles Traveled/day	Total Daily Emissions From Running Exhaust (lb/day)				Total Daily Emissions From Variable Starts (lb/day)		
				VOC	CO	NOx	PM10	VOC	CO	NOx
Inbound	2267	12	27204	16.20	209.95	28.79	12.00	13.47	156.01	7.74
Outbound	2267	12	27204	16.20	209.95	28.79	12.00	18.50	222.29	10.80
Total	4534			32.40	419.90	57.58	24.00	31.97	378.30	18.54

Saturday Special Event Emission Rates

Impact from New Trips (Pass-By Trips Removed)	Number of New Trips Per Day	Average Distance Traveled Per Trip (mi), (note 2)	Total Miles Traveled/day	Total Daily Emissions From Running Exhaust (lb/day)				Total Daily Emissions From Variable Starts (lb/day)		
				VOC	CO	NOx	PM10	VOC	CO	NOx
Inbound	3450	12	41400	24.65	319.50	43.82	18.26	20.50	237.42	11.77
Outbound	3450	12	41400	24.65	319.50	43.82	18.26	20.50	237.42	11.77
Total	6900		82800	49.30	639.00	87.64	36.52	48.65	575.61	28.20

Total

Total Emissions	Projected lb/day Weekdays	Projected lb/day Saturday Special Event	Projected tons/year	Daily District Limits (ton/yr)	Exceeds Limits?
VOC	64.4	98.0	12.6	10	Yes
CO	798.2	1214.7	156.5	NA	
NOx	76.1	115.8	14.9	10	Yes
PM10	24.0	36.5	4.7	NA	

Additional Notes

1. Emission factors based on California Air Resources Board's MVEI7G which uses the EMFAC7G emission factor model (Includes exhaust and evaporative running losses).
2. Distance based on approximate distance between Project site and Lodi and Project site and Stockton.
3. Average speed based on time to reach Project site from Lodi.
4. Conservatively treats internal trips as external trips. "Weekdays" include Monday-Friday and Sunday.
5. Conservatively assumes a special event every Saturday of the year.
6. Time represents period a car was resting before starting up car to travel to Project.

AREA SOURCE EMISSIONS CALCULATIONS

Area Source Emissions for Lodi (Inputs for URBEMIS)			
Facility	Quantity	Units	Assumed Urbemis Equivalent
Tennis	25000	ft ²	Racquet Club
Aquatic Center	20000	ft ²	Racquet Club
Sub total	45000	ft ²	
Field House	175000	ft ²	Single Family Housing (note a)
Central Stadium	120000	ft ²	Single Family Housing (note a)
Basketball / Volleyball	250000	ft ²	Single Family Housing (note a)
Softball Complex	2827500	ft ²	Single Family Housing (note a)
Soccer Fields	5872500	ft ²	Single Family Housing (note a)
Baseball	739500	ft ²	Single Family Housing (note a)
Ice Rink	65000	ft ²	
Equivalent Number of houses	1436	units	Single Family Housing (note a)
Central Office/Training Center	142000	ft ²	General Office Building
Dormitory	54	rooms	Motel (note b)
Hotel	150	rooms	Hotel (note b)
Retail	48000	ft ²	Regional Shopping Center
Medical Center	34000	ft ²	Medical Office Building
RV Park	217500 (or 25 hookups)	ft ²	Mobile Homes (note b)

Notes

- (a) Represent fields as single family housing units to capture landscape emissions from these fields. One single family housing unit assumed to be equivalent to 7000 ft² of open field. Remove natural gas usage from these housing units to better represent fields.
- (b) Assume 25% occupancy rate.
- (c) Assume units have no fireplaces.
- (d) Assume emissions from consumer products are negligible.

URBEMIS OUTPUT

URBEMIS 7G: Version 3.1

File Name: LODI.URB

Project Name: Lodi Sports Complex - Area Sources

Project Location: San Joaquin Valley

DETAILED REPORT - Annual

AREA SOURCE EMISSION ESTIMATES

Source	ROG	NOx	CO	PM10
Natural Gas	0.04	0.49	0.20	0.00
Wood Stoves	0.00	0.00	0.00	0.00
Fireplaces	0.00	0.00	0.00	0.00
Landscaping	0.28	0.03	2.29	0.01
Consumer Prdcts	0.00			
TOTALS (tpy, unmitigated)	0.32	0.51	2.48	0.01

Changes Made to the Default Values

Area Source Related:

The default natural gas option switch has been changed

The default wood stove option switch has been changed

The default consumer products option switch has been changed

The default area source mitigation measure option switch has been changed

The residential percentage using natural gas of 100 has been changed to 2

The amount of wood burned per year and/or the percentage of wood stoves has been modified by the user.